Waste Collection System

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Question

When and how do you go?

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Question

When and how do you go?
When you have to go where no one has gone be

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Question

When and how do you go?
When you have to go where no one has gone be
and you have never gone where they have gone

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Question

When and how do you go?
When you have to go where no one has gone be
and you have never gone where they have gone
Especially when you really have to go

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Answer

Waste Control System (WCS)
or
Temporizing Olfactory Insults in Low Earth Trajectories (TOILET)

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Waste Collection System

Agenda

- **History of Microgravity human waste management**
- **Shuttle Waste Control System Overview**
  - **Urine Collection System**
  - **Feces Collection System**
  - **Waste Water Management**
- **Space Station Toilet**
- **Future Waste Management Systems**
  - **Moon, Mars**
  - **Bioplex**

Learning Objectives

- **The Flight Crew will understand the complex problem of handling microgravity *Supplementary Human Internal Trash* (SHIT).**
- **The Flight Crew will understand the complex Shuttle Waste Control System and it Procedures and Protocols for *Deep Understanding of Microgravity Potties* (DUMP)**
- **The Flight Crew will become knowledgeable and proficient in *Crapper Resource Management* (CRM)**

History of the WCS

- **Jules Verne Totally Avoided the Topic of Human Waste in his books**
- **Buck Rogers just…. never went**
- **Star Trek Probably Invented Artificial Gravity to Deal with Waste Control Issues.**
- **2001 a Space Odyssey had extensive direction for the microgravity toilet.**

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History of the WCS

- **Mercury, Gemini, Apollo and SkyLab**
- **Shuttle**
- **Shuttle-Mir**

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The Shuttle Toilet

- Located on Mideck
- 27 x 27 x 29 inches
- Privacy Curtains

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The WCS

- Urine Collection System
- Fecal Collection System
- Waste Water Management System

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Urine Collection System

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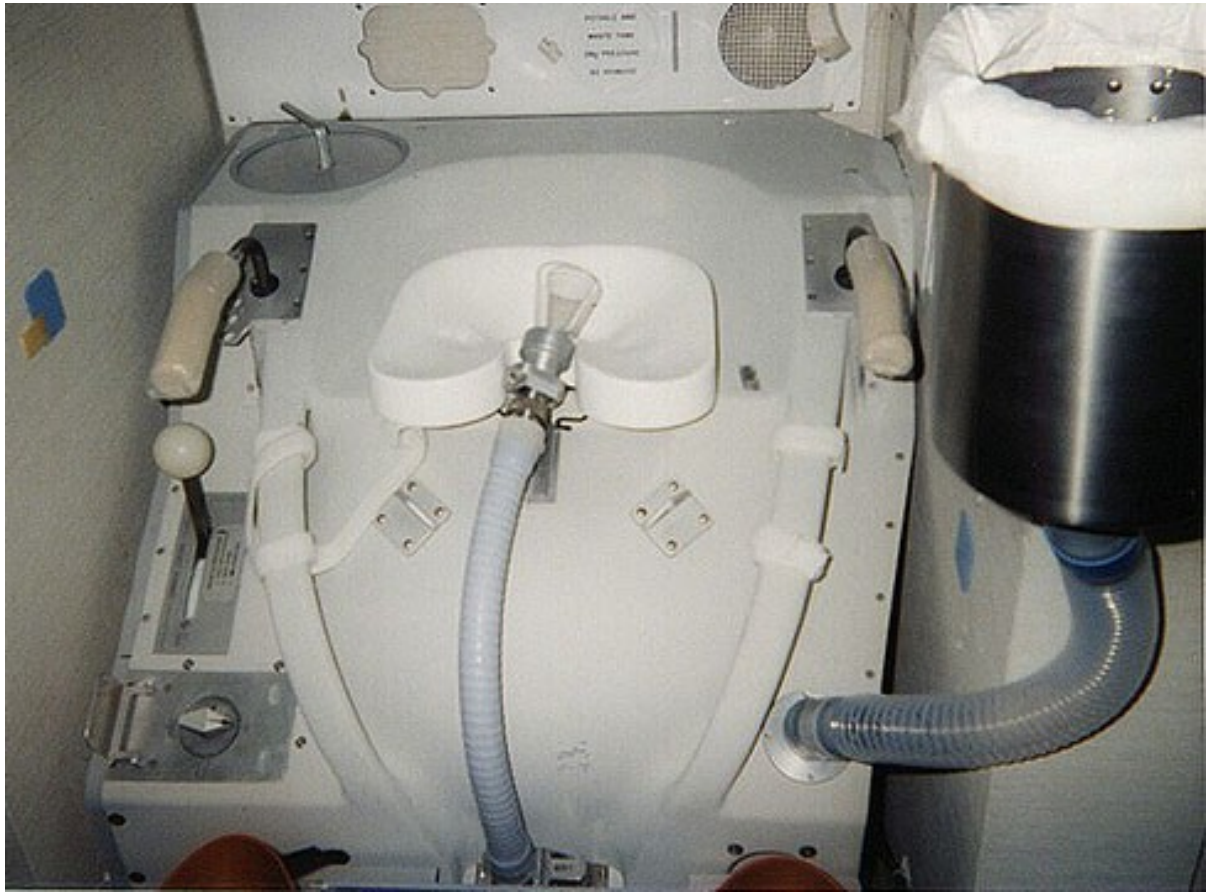
Waste Collection System

Urinal

- Fan Separator
- Centrifugal Separator
- Odor and Bacteria Filter
- EMU Dump



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Fecal Collection
- Position
- Air Flow
- Striker Plates
- Liner
- Flushing
- Recycle

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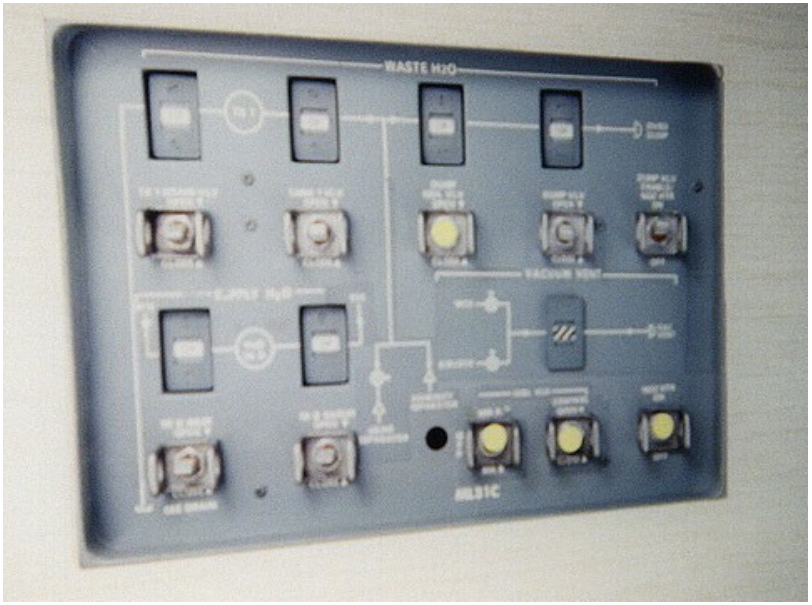
Waste Collection System



CRM
(Crapper Resource Management)

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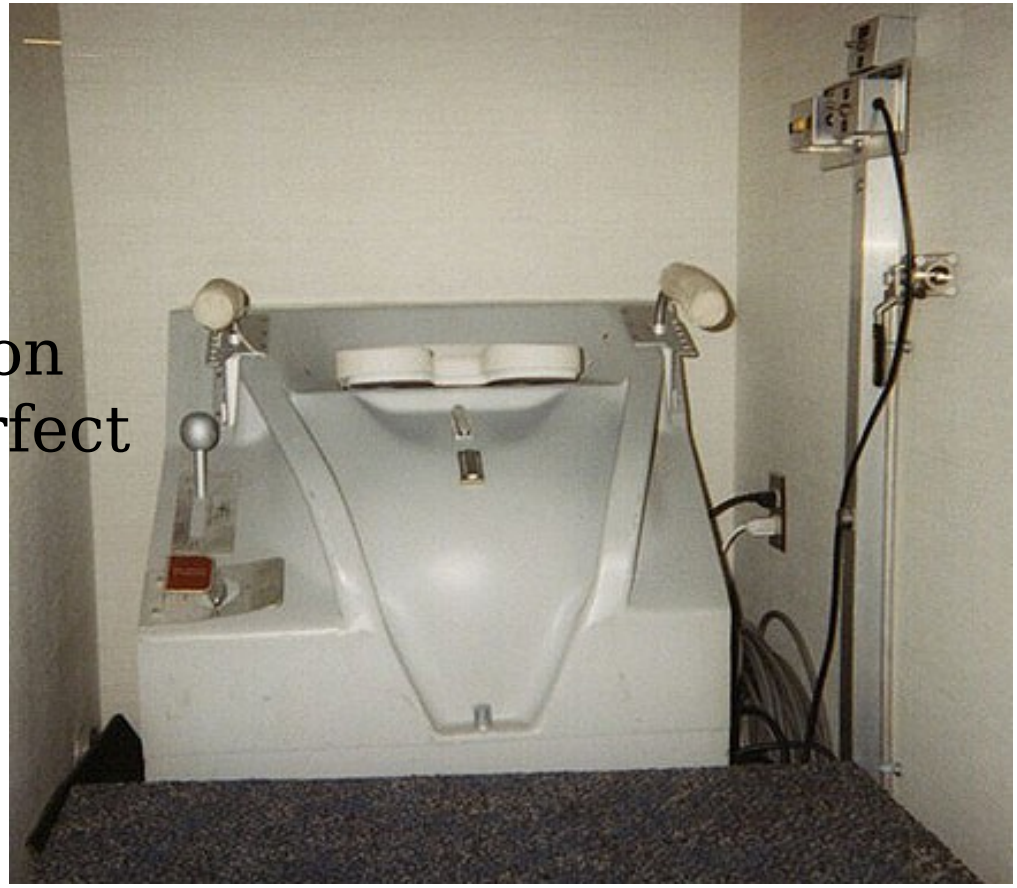
Waste Collection System

<u>Simulators</u>

- Camera
- High Fidelity Version
- Practice Makes Perfect



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Extravehicular Maneuvering Unit

- Urine Collection Device (males)
- Diapers (female)
- Interface with WCS

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Waste Collection System

Backup Systems

- Apollo Style Fecal Bags
- Contingency Urine Collection Device

Claude Nicollier
STS-46

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Future WCS Systems

- Space Station
- Regenerative Life Support Systems

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Microgravity Flight Crew Edict

- **AVIATE**
- **NAVIGATE**
- **DEFICATE**

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